The comparison of ArtiSential® versus conventional single port surgery in laparoscopic totally extraperitoneal inguinal hernia repair : a propensity score-matched study

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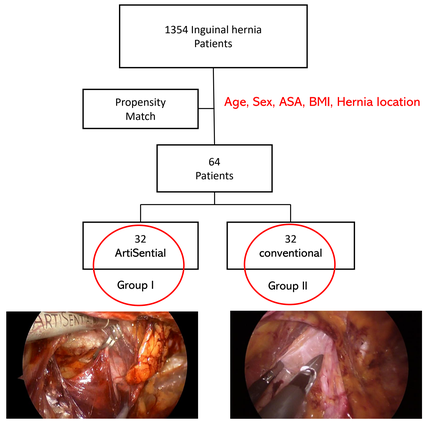
Background

Single-port laparoscopic totally extraperitoneal (SP TEP) herniorrhaphy has been suggested advantages including better cosmetic outcome, less post-operative pain. Multi-joint mechanics and ergonomics are advantages of robotic systems; however, they are less cost-effective. Several laparoscopic articulating tools have been introduced as alternative to robotic systems. The ArtiSential® (LIVSMED Inc., Republic of Korea) is an 5mm diameter pistol-handle instrument that has complete articulating function like human wrist and intuitive controllability. This study aimed to compare surgical outcomes between SP TEP using ArtiSential® and conventional laparoscopic TEP(CL TEP) inguinal hernia repair.

Purpose

This study aimed to compare surgical outcomes between SP TEP using ArtiSential® and conventional laparoscopic TEP(CL TEP) inguinal hernia repair.

Figure1. Flow diagram of patient selection.



Methods

Patients

- Minimally invasive surgery
- who underwent SP TEP for primary inguinal hernia at Hansol Hospital
- Between September 2018 & August 2023
- Exclusion
  - age <12 years
  - ASA classification IV or worse
  - emergency repair for outlet obstruction or strangulation.
- Of the 1354 patients
  - 32 underwent SP TEP using ArtiSential® (group A)
  - 1322 underwent CL TEP (group B)
  - After propensity score matching(PSM),
    - 32 patients were assigned to each group(Fig 1.)

Mesh apply

- A 10x15 cm sized ProGrip™ Laparoscopic Self-fixating Mesh or 3DMax™ MID Anatomical Mesh was inserted according to surgeon's preference and was secured without tacker fixation (Fig2, 3).

Figure2. 3DMax™ MID Anatomical Mesh apply

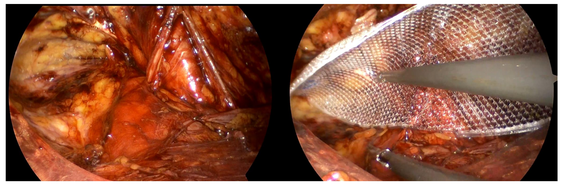


Figure3. ProGrip™ Laparoscopic Self-fixating Mesh apply

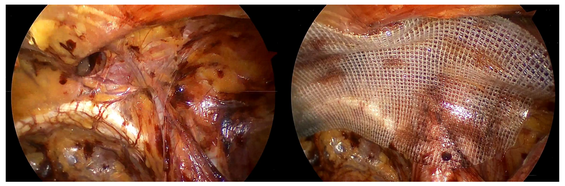


Table 1. Baseline characteristics

	Group A (n=32) ArtiSential®	Group B (n=32) Conventional	p-value
Age, years	62.3 ± 17.1	65.3 ± 15.2	0.455
Male, n (%)	49 (61.3)	47 (58.8)	0.872
BMI (Kg/m²)	23.6 ± 2.4	23.6 ± 2.8	0.974
ASA, n(%)			0.478
1	5 (15.6)	9 (28.1)	
2	26 (81.3)	22 (68.8)	
3	1 (3.1)	1 (3.1)	
BPH, n(%)	3(9.4)	4(12.5)	0.689
DM, n(%)	6(18.8)	3(9.4)	0.281
Prostate op history	3(9.4)	4(12.5)	
HTN, n(%)	17(53.1)	9(28.1)	0.074
Hernia location			0.962
Bilateral	6 (18.8)	6 (18.8)	
Right	15 (46.9)	14 (43.8)	
Left	11 (34.4)	12 (37.5)	

Results

- Total recurrence rate before PSM: 0.14%(2/1354)
- Thirty-two patients were evaluated in each group.
- There was no significant difference in the baseline characteristics between group A and B (Table 1).
- Patients with bilateral inguinal hernia were six (18.8%) in each group. Patients with previous prostate cancer surgery were no difference between the two groups (A: 3(9.4%) vs B: 4(12.5%), p=0.689).
- Mean operative time was no difference between the two groups (A: 56.8 ± 22.3 vs B: 46.6 ± 27.6 day, p=0.110).
- Mean length of hospital stay (LOS) after surgery was no difference between the two groups (A: 1.0 ± 0.18 vs B: 1.1 ± 0.35 day, p=0.657).
- Postoperative complications were similar between the two groups. Re-operation and re-admission within postoperative 90 days were not occurred in each group (Table 2).

Table 2. Perioperative outcome

	Group A (n=32) ArtiSential®	Group B (n=32) Conventional	p-value
Operative time (min)	56.8 ± 22.3	46.6 ± 27.6	0.110
Hernia type			0.422
Direct	8/38(21.1)	6/38(15.7)	
Indirect	30/38(78.9)	32/38(84.2)	
Postoperative urinary retention	0(0)	2(6.3)	0.151
Median VAS (POD1)	1.0 ± 0.18	1.2 ± 0.37	0.091
Length of hospital stays (day)	1.0 ± 0.18	1.1 ± 0.35	0.657
Postoperative complication grade ≥IIIa, n (%)	0 (0)	0 (0)	-
Re-admission within 30 days, n (%)	0 (0)	0 (0)	-
Mortality within 30 days, n (%)	0 (0)	0 (0)	-

Conclusions

- Laparoscopic SP TEP using ArtiSential® can achieve acceptable clinical outcomes including patients with previous prostate cancer surgery.
- ArtiSential® could be an alternative approach to robotic surgery for inguinal hernia.
- Long term follow up is required for ArtiSential® surgery.

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